Showcase Europe: Energy Guide for United Kingdom

I. Statistical information

Primary Energy Consumption (Mtoe)

	1998	1999
Coal	37.84	38.80
Petroleum	79.55	74.44
Natural Gas	79.02	83.74
Hydro	1.51	1.67
Nuclear	24.53	23.60
Other	0.43	0.43
Total	**222.89**	**218.68**

II. Evaluation of Sector

Electrical Power Systems, Oil and Gas Field Machinery and Services and Renewable Energy equipment

A) On a scale of 1(low) to 5 (high), evaluate the priority given by the government to energy development: 5
B) On a scale of 1 (low) to 5 (high), evaluate country's receptivity to U.S. products and services: 4
C) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from local domestic suppliers: 3
D) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from third country suppliers: 2
E) On a scale of 1 (severe) to 5 (little), evaluate overall effect of trade barriers on U.S. barriers on U.S. exports of products and services: 5

III. Narrative Information

The power generation sector in the United Kingdom is 100% privatized and has undergone a great deal of changes since 1998. Although the government has liberalized the energy industry, the Commission overseeing mergers and monopolies is extremely alert to any semblance of a private corporation having too great a market share, and will quickly order divestment of assets. The government has placed a ban on any business entity owning both components of supply and distribution within the electricity market.

Emissions reducing equipment continues to be in demand as the government is placing a very high priority on meeting European Union -agreed emissions levels by 2005 as well

as Kyoto climate change targets, while improving efficiency in production of electricity. Furthermore, the government has issued a policy requiring electricity suppliers to purchase 10% of their electricity from renewable energy sources by 2010, creating a demand for better renewable energy technology such as wind turbine and waste gasification processes.

Production of Primary Fuels, 1997 – 1999 (Million tons of oil equivalent)

	1997	1998	1999
Petroleum	140.6	144.8	150.3
Natural Gas	86.4	90.8	99.7
Coal	31.9	27.4	25.2
Primary Electricity	23.4	24.1	23.2
Total	**282.3**	**287.1**	**298.4**

Source: UK Energy in Brief, Nov. 2000

Final Energy Consumption, 1999 (Million tons of oil equivalent)

	Industry	Domestic	Transport	Services	Total
Coal & Manufactured Fuels	3.6	2.5	-	0.2	6.3
Gas	15.9	30.6	-	10.4	56.9
Oil	6.1	3.2	53.0	2.7	65.0
Electricity	9.3	9.5	0.7	8.0	27.5
Renewable	0.5	0.2	-	0.2	0.9
Total	**35.5**	**46.1**	**53.8**	**21.4**	**156.8**

Source: UK Energy in Brief, Nov. 2000

Electricity Consumption, 1997 to 1999 (TWh)

	1997	1998	1999
Energy Industries	8.3	8.1	8.3
Industry	106.2	106.8	109.8
Domestic	104.5	109.6	110.4
Services	100.2	100.5	101.4
Total	**319.1**	**325.0**	**329.9**

Source: UK Energy in Brief, Nov. 2000

UK gas and electricity price levels

The domestic supply market for gas was fully opened to competition in May 1998, and the electricity market in May 1999. There are a total of 26 companies selling gas to domestic consumers and 17 companies selling electricity. Perhaps the most significant impact of deregulation has been the introduction of this competition. While traditional concerns of price, safety and reliability remain, energy companies need to look to new areas to differentiate their products. Examples include offering CHP units and increased supply from renewable sources.

Gas prices in the UK are among the cheapest in the European Union. The New Gas Trading Arrangements (NGTA) came into effect in October 1999. The arrangements consist of an auction for entry capacity into the National Transmission System (NTS) and a screen based trading system for the on the day commodity market.

Industrial electricity prices were slightly above average for both EU and G7 countries in 1999. Domestic prices were second lowest among the G7 and third lowest in the EU. Although price comparisons are sensitive to exchange rate fluctuations, the figures are a good indication of the benefits brought about through liberalization.

UK electricity industry structure

The transmission of electricity is controlled by the National Grid Company (NGC), which is responsible for calling up generation plants to meet demand. Distribution to most customers is in the hands of the 14 Regional Electricity Companies (RECs). Until 1999, each REC owned and operated the distribution network in what was known as its franchise area. Every REC supplied electricity to a franchise market in its region, although customers with a minimum demand of 100kW or more could buy from any supplier. The franchise market was removed in 1999, allowing all customers the freedom to purchase electricity from the supplier of their choice.

In Scotland, generation capacity has always been more diverse than in England and Wales due to the presence of a large hydro-electric capacity. ScottishPower and Scottish Hydro-Electric remain vertically integrated companies, which generate, transmit, and supply electricity to final consumers. However, EU directives are calling for a separation of the combined elements of their current structure by April 2002. Currently, there is an over-capacity in the Scottish system and this excess capacity is used to supply England and Wales through the interconnector.

The structure of the industry in Northern Ireland has changed frequently in the recent past. Currently, Northern Ireland Electric, part of the Viridian Group, is responsible for power procurement, transmission, distribution and supply. However, supply and generation are open to competition.

In addition to the private utilities, there are also an increasing number of independent power producers (IPPs) and a large number of autogenerators (companies producing power for their own use).

Developments in energy liberalization and competition

In May 1999, the final phase of UK electricity liberalization took place. As a result, the UK became the first country in the world to offer all 26 million electricity and gas customers – industrial, commercial, and domestic – the choice of which company supplies their energy. A second major result of liberalization is that foreign investors may now acquire RECs. U.S. companies have acquired 7 of the 14 RECs. Foreign acquisitions have significantly changed the structure of the market, and resulted in greater pressures for efficiency.

This pattern of competition exists only in England and Wales, while is Scotland and Northern Ireland, it has been markedly different. The Scottish companies securing customers from each other's areas accounted for practically all of the second-tier market, and the small scale in Northern Ireland and its regional isolation, are not as conducive to the development of competition as in England and Wales.

The new Utilities Bill, developed by the Department of Trade and Industry (DTI), provided for the replacement of the wholesale electricity pool with a futures-style trading market, and bilateral contracts. The new system is known as the New Electricity Trading Arrangement (NETA). NETA ensures separate licensing of electricity supply and distribution, and introduces a bar on supply and distribution licenses being held by the same organization. It is expected that NETA will lead to reductions of at least 10%, in electricity prices to all customers. The government replaced the previous Pool with NETA on March 27, 2001.

The introduction of NETA and NGTA created a growing market for energy exchanges. For the most part, these new exchanges function much like a traditional stock market exchange, offering current, futures and options contracts. The primary goal behind energy exchanges is to offer a true market value price based on supply and demand while providing anonymity and transparency. There are currently five energy exchanges operating in the UK: UKPX, APX, PowerEx, EnEx (gas trading), and IPE (oil and gas trading). It is difficult to predict which exchanges will survive into the future as the market is still young.

Since privatization, there has been a shift toward gas generation, the bulk of which utilizes the recent Combined Cycle Gas Turbine (CCGT) technology. A total of 10,000 MW was ordered in the first 18 months after privatization, and about half of these orders were placed by National Power and PowerGen, while the other half of these orders were placed by new competitors (independent power producers). The supplier of gas for most of these plants was British Gas.

Concurrently, demand from power stations for coal has dropped due to the expansion of gas. There is some hope that a decreasing reliance on nuclear energy will be met through coal, but international coal prices make British coal prohibitively expensive. Conditions are expected to deteriorate further as the gas market becomes increasingly more liberal. Government subsidies may help the industry through the transitional years.

Overall, the new regulatory framework for the UK energy sector spells out more opportunities for US companies and investors. Total investment percentage in the UK by U.S. companies and energy groups has approached 85.3% of the total UK inward FDI of $12,834 million in 1999. Privatization has dispersed monopolies and provided opportunities for U.S. companies to become involved in the energy market.

Oil & Gas Industry and Equipment Market

The following figures represent the reserves, production, capacity and consumption of oil and gas in the United Kingdom.

	1997	1998	1999
Oil		**Million tons**	
Cumulative Production	2,175	2,306	2,444
Estimate of remaining discovered reserves	2,015	1,800	1,665
Total reserves in present discoveries	**4,190**	**4,105**	**4,110**
Gas		**Billion cubic meters**	
Cumulative Production	1,223	1,312	1,410
Estimate of remaining discovered reserves	1,985	1,795	1,750
Total reserves in present discoveries	**3,210**	**3,105**	**3,160**

Source: UK Energy in Brief, Nov. 2000

Drilling activity in the UK: number of wells

	1997	1998	1999
Offshore			
Exploration	61	47	16
Appraisal	35	33	20
Development	257	281	234
Onshore			
Exploration	7	5	6
Appraisal	2	9	2
Development	26	21	11

Source: The Energy Report 2000

In 1999, 8.2% of the UK's proven and probable oil reserves were extracted. Although the UK has large reserves of fossil fuels, the level of reserves remaining in present discoveries was revised down from 2.0 billion tons to 1.7 billion tons. This revision is due to limited new discoveries and the low prices for oil on the international market during 1999. However, reserves are predicted to sustain the current level of production for more than a decade.

Gas reserves have been revised on an annual basis with new discoveries contributing greatly to estimated total reserves. However, new discoveries are typically of smaller reserves that are exploited relatively quickly. Gas reserves were revised downward at the end of 1999 due to low international prices and the co-production with oil. It is typical that a decrease in oil reserves will coincide with a decrease in gas reserves.

Renewable Energy Equipment: Best prospects for SMEs

Under new government plans to promote non-fossil fuel electricity generation, electricity suppliers will be required to buy 10% of their output from renewable energy sources by 2010. Renewable sources accounted for 2.8% of the electricity generated in the UK in 1999, up from 2.6% the year before.

Total Use of Renewables (Thousand tons of oil equivalent)

	1997	1998	1999
Active Solar Heating	9.0	9.4	10.0
Onshore Wind	57.3	75.4	77.2
Hydro	358.5	450.3	460.1
Landfill Gas	316.6	402.4	572.0
Sewage Sludge Digestion	191.9	180.6	188.8
Wood	710.3	710.3	710.3
Straw	71.7	71.7	71.7
Municipal Solid Waste	424.2	574.0	580.2
Other Biofuels	189.9	198.2	241.7
Total	**2,329.4**	**2,672.3**	**2,912.0**

Source: UK Energy in Brief, Nov. 2000

Under the new Utilities Bill, the existing Non Fossil Fuel Obligation (NFFO) support mechanism (based on competitive tendering) for renewables has been ended. As mentioned, electricity supply companies will be obligated to obtain a proportion of their power from renewable sources. Importantly, it was confirmed that renewables are exempted from the Climate Change Levy, a new tax on businesses according to the amount of energy that they use. This exemption will help level the playing field and improve the competitiveness of renewable power, as businesses are compelled to seek more efficient and less polluting power sources.

In February of 1999 a new policy on renewables was introduced called the Renewables Obligation. Similar to the previous NFFO, this plan requires suppliers to provide a certain amount of power from renewable sources. Forecast for implementation in October 2001, the new Renewables Obligation will build on the successes of previous programs in order to achieve a targeted 5% renewable energy supply by 2003. The new Renewables Obligation will remain in place until 2026, further illustrating the government's commitment to renewable energy.

Renewables Obligation Status Summary as of 30 June 2000

	Contracted Projects		Live Projects	
Technology	**No.**	**Capacity MW DNC**	**No.**	**Capacity MW DNC**
Biomass	32	255.960	6	64.284
Hydro	146	95.412	56	38.798
Landfill Gas (LFG)	329	699.713	154	322.378
Municipal and Industrial Waste (MIW)	90	1398.159	15	190.349
Sewage Gas	31	33.864	24	25.039
Wave	3	2.000	-	-
Wind	302	1153.738	69	161.200
Total	**933**	**3638.846**	**324**	**802.048**

Source: The Energy Report 2000

There is concern about the profitability of renewables since the implementation of NETA. Under NETA energy producers will post predicted supplies on the open market to be bid upon by suppliers. If a generator's output does not match the contract position, charges will be applied for any shortfall or excess electricity. Under this structure, smaller renewable generators could have difficulty in predicting their output in advance, on a half-hourly basis, and may fare less well than larger, output-flexible generators. A niche may arise for energy exchanges that are able to better serve the renewable community.

The best prospect areas for US firms are for grid-connected wind turbines and solar electric photovoltaic (PV). The market for the former has grown by 118% since 1995 and PV arrays for solar electric equipment is a market that has grown 75% since 1995.

Forecast for these prospective markets over the next two years (in $US million)

Equipment	**2000**	**2001**
Grid Connected Wind Turbines	640	727
PV Solar Electric	14	32

Nuclear Power in the UK

Presently, the building of new nuclear generation is not competitive with fossil fuels for electricity generation. Nuclear generation, supplied by reactors built during the 1970s and 80s, accounted for 26% of electricity generation in the UK in 1999, down from 28% the year before. This output is provided by two companies, British Energy Plc and BNFL/Magnox. Due to the maturity of the UK nuclear market, the UK is recognized as a world leader in nuclear services that include fuel manufacture, reprocessing, waste management, decommissioning, and physical security against nuclear theft/terrorism. BNFL is the UK's primary provider of nuclear services.

Gross Electricity Supplied by Nuclear Generation

	1998	**1999**
Electricity Supplied	91 TWh	88 TWh
% of Electricity Generation	28%	26%
Employment	30,500	30,000
Turnover (in billions)	£4.7	£4.7

Source: UK Energy in Brief, Nov. 2000

IV. Major Procurement or Private Projects on the Horizon

Recent attention is being focused on the construction of offshore wind farms that can generate on average 30% more energy than similar onshore projects. The Blyth Offshore Wind Farm, the UK's first full-scale operation of its kind, was completed and opened to full operation on December 7, 2000. Consisting of two 2MW generators built 1km from the coast of Blyth, Northumberland, the project was a pioneering effort to test the feasibility of future offshore projects.

In April 2001 the Crown Estate, the body owning the British sea bed, granted leases to 18 companies to begin construction of offshore wind fields. Each site, located 5km from the coast, will be large enough to support 30 turbines each capable of producing 3MW, enough to supply over 1.1 million homes annually. The project represents a private sector investment of $2.3 billion.

V. Major Trade Events/Fairs & Conferences

August 21 – 25, 2001 **Renewable Energy**, Brighton
Seminar reviewing the role of renewable energy systems in meeting the world energy demand in electricity. Topics will include up to date technologies in manufacturing and operation of various renewable energy devices. Additional information can be found at www.wrenuk.co.uk.

September 4 –7, 2001 **Offshore 2001**, Aberdeen
Trade show focused on oil and gas exploration, services and related industries. This exhibition is the largest offshore oil and gas of its kind in the Western Hemisphere. For more details check the Offshore Europe website at www.offshore-europe.co.uk

October 10, 2001 **Photovoltaics and Fuel Cells – the Prospect for Integrated Systems**, London
Conference discussing the potential for such systems and examining ways in which they can become commercially viable. Also discussing practical applications for renewable energy. Additional information can be found at www.brookes.ac.uk/other/uk-ises/uk_conferences.html.

VI. Country's Method of Procurement

As energy is a utility service, procurement by the licensed utilities are conducted in accordance with EU Utilities Directive (93/38/EEC) and Utilities Remedies Directive (92/12/EEC). The Directives ensure that supply and contracts worth more than 600,000 Euro are advertised in the EU Official Journal as either procurement notices or periodic indicative notices (PINs). Website: http://www.ted.eur-op.eu.int

In addition, several regional electric companies (RECs) advertise their tenders through "Qualification Systems" advertised in the Official Journal (OJ). Under these systems, vendors must pre-qualify to bid on a contract by registering their name with a database service. Once a contract is available, the REC will then contact the vendors on the database. RECs that utilize this technique include Seeboard, Easter Electricity, and Midlands Electricity. Contact these companies to find out how to qualify for their databases. Yorkshire Electricity, Scottish-Hydro Electric, and South Western Electricity have established a common database for goods and service vendors with Achilles Information Services, 67 Milton Park, UK-Abingdon, 0X14 4RX, tel: +44 1235 82 0813; fax: +44 1235 82 1093.

VII. Means of financing procurement

Most new projects are project financed, usually with a 50-80% debt. Smaller projects have generally been financed using the developer's resources or through private investors and local banks.

VIII. Points of Contact

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